

Notice of Allowability

Application No.

10/051,324

Examiner

Charles E. Cooley

Applicant(s)

MILLER ET AL.

Art Unit

1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the response filed 14 SEP 2004.
2. ☒ The allowed claim(s) is/are 1,3-6,8,10-17,19-25 and 27-34.
3. ☒ The drawings filed on 22 January 2002 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Amendments to the Claims:

Claim 4, line 1: replace "2" with --1--.

* * *

2. The above change was to correct the dependency of claim 4 from a cancelled claim to claim 1 (as appearing in the last set of claims filed 23 JAN 2004).

3. The following is an Examiner's Statement of Reasons for Allowance:

The affidavit and arguments filed on 14 SEP 2004 under 37 CFR 1.131 are sufficient to overcome the document entitled "Fuzzy and Probabilistic Control Techniques Applied to Problems of the Chemical Process Industries".

The claims are deemed allowable over the prior art of record, particularly the documents applied in sections (5) and (6) of the final rejection of 13 APR 2004, in view of Applicant's remarks filed 14 SEP 2004 and because the prior art does not teach or

suggest a centrifuge including (a) a control system configured to sense feed variables of the mixture into the centrifuge and at least one parameter of the first liquid phase component or the second liquid phase component and to adjust a feed temperature and a feed rate of the mixture based on the variables, the parameter and the set of fuzzy logic rules; (b) the recited a feed forward control system and feedback control system which comprises a feedback controller including a conflict resolution portion configured to coordinate the operation of the controller and the feedback controller; (c) a feed forward control system comprising a plurality of sensors, a fuzzy soft sensor in signal communication with the sensors programmed with a set of fuzzy logic rules, and a controller in signal communication with the fuzzy soft sensor, the feed forward control system configured to sense feed variables of the mixture into the centrifuge and to adjust a feed temperature and a feed rate of the mixture based on the feed variables and the set of fuzzy logic rules; and a filter in signal communication with the fuzzy soft sensor configured to differentiate signals representative of the feed variables from noise; or (d) a fuzzy soft sensor in signal communication with a first sensor configured to sense a feed temperature (T1) of the mixture and a second sensor configured to sense a basic solids and water content of the mixture; a set of fuzzy logic rules programmed into the fuzzy soft sensor and configured to express input from the first sensor and the second sensor into at least one feed change variable; and a controller in signal communication with the fuzzy soft sensor configured to adjust the temperature set point (T2) for the mixture, and to adjust a speed of the pump to achieve a selected feed rate for the mixture. The prior art also does not teach or suggest separation

processes including the steps of providing a centrifuge and (a) providing a fuzzy soft sensor programmed with a set of fuzzy logic rules; sensing at least one feed variable of the mixture and at least one parameter of the first liquid phase component or the second liquid phase component; and adjusting a feed temperature and a feed rate of the mixture into the centrifuge based on the feed variable, the parameter and the set of fuzzy logic rules or (b) providing a feed pump configured to pump the mixture into the centrifuge at a feed rate; providing a heater configured to heat the mixture to a temperature set point; providing a fuzzy soft sensor programmed with a set of fuzzy logic rules that relate a feed water composition change of the mixture, a feed solid composition change of the mixture, and a cold feed temperature change of the mixture to a feed pump speed change for the feed pump, and to a heater setpoint change for the heater; sensing the basic solids and water content of the mixture and the cold feed temperature; filtering signals representative of the basic solids and water content and the cold feed temperature from noise; relating the basic solids and water content to the feed water composition change and to the feed solid composition change; and adjusting the feed rate and the temperature set point using the rules, the sensing step, the filtering step and the relating step.

As explained by Applicant, both the May 1998 and August 1998 articles applied in the last office action disclose a feedback system wherein feedback variables in the separated product oil and the separated product water are sensed whereas the presently claimed control system also senses feed forward variables of the mixture into the centrifuge which is not contemplated by either of the 1998 articles. In addition, the

present system resolves conflicts prior to adjusting the feed rate and the feed temperature of the mixture based on the feedback variables and the feed forward variables. The pending claims recite feed forward features, wherein variables of the mixture into the centrifuge are sensed and used to control the centrifuge which are features not taught or suggested by the 1998 articles.

4. Any comments considered necessary by applicant must be submitted no later than the payment of the Issue Fee and, to avoid processing delays, should preferably **accompany** the Issue Fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles E. Cooley whose telephone number is (571) 272-1139. The examiner can normally be reached on Mon-Fri. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in cursive script, appearing to read "Charles", followed by a stylized, abbreviated signature that looks like a "C" with a horizontal flourish.

Charles E. Cooley
Primary Examiner
Art Unit 1723

8 NOV 2004